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ABSTRACT

The goal of this study was to obtain feedback from relevant community businesses regarding skills needed by employees in Sustainable Technologies. Survey results will help design the innovative Sustainable Technologies curriculum, which is under development at the Maui Community College. In the fall 1999 semester, the Sustainable Technologies Coordinator and the Assistant Dean of Instruction developed a questionnaire (included in the appendix) to survey relevant community representatives regarding the value of Sustainable Technologies toward various employee skills. The questionnaire presented 49 skills from seven curricular categories: general education, waste water quality, energy related tech, occupational safety, environmental tech, potable water quality, and hazardous materials. The 26 respondents were asked to rate each of the skills as "Not Applicable," "Low," "Medium," or "High" in importance for successful job performance. The top three skills are from the general education category: English speaking, English writing, and computer literacy. The skills next in line are all from the occupational safety category: accident prevention, OSHA, safety plans, worker compensation, hazardous materials, emergency response, occupational health, and industrial hygiene. A rather large number of skills were rated as "Not Applicable" or left blank. Eighteen skills accumulated lower than 20 points (out of a possible 78). The response rate was quite low (11.5%) and so are the rankings in general. These results raise several questions for further consideration: validity of the fax methodology, complexity of the questions, and relevancy of studied skills to community need. (VWC)

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ED 443 464

Maui Community College

SUSTAINABLE TECHNOLOGY:
Skills Required by Employers on Rural Maui

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Spring 2000

U.S. DEPARTMENT OF EDUCATION
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Maui Community College

SUSTAINABLE TECHNOLOGY
Community Survey of Requisite Skills

Spring 2000

PURPOSE

The goal of this study was to obtain feedback from relevant community businesses regarding skills needed by employees in Sustainable Technologies. Survey results will help design the innovative Sustainable Technologies curriculum, which is under development at the Maui Community College.

METHODOLOGY

In the Fall 1999 semester, the Sustainable Technologies Coordinator and the Assistant Dean of Instruction, under auspices of the Dean of Instruction, developed a questionnaire (shown in Appendix A) to survey relevant community representatives regarding their value toward various employee skills. The questionnaire presented 49 skills from seven curricular categories, including:

General Education	Occupational Safety	Potable Water Quality
Waste Water Quality	Environmental Tech	Hazardous Materials
Energy Related Tech		

In January 2000, the questionnaire was faxed to 326 representative businesses on a list generated by the MCC Office of Continuing Education and Training. The list was drawn from two sources: businesses participating in the Maui Chamber of Commerce and those previously participating in Office's non-credit courses in retailing.

Of the 326 listed names, 92 held fax numbers that did not transmit due to no answer or a busy signal, resulting in a sample size of 234. The number of respondents was 27, for a response rate of 11.5 percent. One respondent returned a blank form stating the survey was not applicable, netting 26 usable returns.

RESULTS

A. Specific Job Skills Needed

Analysis. Respondents were asked to rate the 49 skills as Not Applicable, Low, Medium, or High in importance for successful performance on the job. Table A displays the number of respondents selecting the various ratings on each competency.

The analysis then assigned points to ratings according to this scheme:

Points	Ratings
0	= Not applicable or blank
1	= Low
2	= Medium
3	= High

Adding points across all participants yields a maximum score of 78 points -- if all 26 respondents rated a skill High (3). Table A reports the total points for each skill in the "Points" column, as well as the percent of maximum score shown under Percent (by dividing each sum by 78), in order to evaluate which skills are weighted the most important overall.

The most highly rated skills appear first in the table, and then in descending order.

Top Requirements Overall. The top three skills are from the General Education category:

1. English Speaking 2. English Writing 3. Computer Literacy

That English Writing is highly regarded is not unexpected; perhaps unanticipated is how English Speaking is regarded even more highly than English Writing.

The skills next in line are all from the Occupational Safety category:

4. Accident Prevention 5. OSHA 6. Safety Plans 7. Worker Compensation
8. Hazardous Materials 9. Emergency Response 10. Occupat'l Health 11. Industrial Hygiene

A rather large number of skills were rated as Not Applicable or left blank. As seen from Table A, 18 skills accumulated fewer than 20 points (<25% percent maximum).

B. Comparative Ratings of Skills within Curricular Categories

Analysis. Total points for the various skills within each curricular category were bar graphed and displayed in Figures 1 – 7, in order to compare the relative importance of skills within each category. The graphs also contain a bar for the highest ranked skill (English Speaking) and the lowest ranked skill (Internship in Energy) for purposes of referencing the anchor points.

General Education: While English Speaking, English Writing, and Computer Literacy are among the most highly regarded skills overall, other General Education attributes receive less

Table A
SusTech Skills in Rank Order of Importance

Rnk	Category	Competancy	NA/--	Low	Med	High	Points*	%Max78
1	Gen'lEd	Eng-Sp	0	0	6	20	72	92.3%
2	Gen'lEd	Eng-Wrtg	0	0	10	16	68	87.2%
3	Gen'lEd	ComptrLit	1	1	9	15	64	82.1%
4	OccSfty	AccPrevent	3	1	7	15	60	76.9%
5	OccSfty	OSHA	4	3	5	14	55	70.5%
6	OccSfty	SftyPlan	4	1	9	12	55	70.5%
7	OccSfty	WrkrComp	4	1	10	11	54	69.2%
8	OccSfty	HazMat	3	4	8	11	53	67.9%
9	OccSfty	EmrgyRsp	5	2	9	10	50	64.1%
10	OccSfty	OccHlth	6	2	7	11	49	62.8%
11	OccSfty	IndusHygiene	5	4	6	11	49	62.8%
12	Gen'lEd	ElectricTech	4	8	8	6	42	53.8%
13	Gen'lEd	SocSci	4	7	12	3	40	51.3%
14	HazMat	EnvHlth	8	4	8	6	38	48.7%
15	Gen'lEd	Arts/Hum	3	12	9	2	36	46.2%
16	Gen'lEd	PhysSci	6	7	10	3	36	46.2%
17	HazMat	EnvLaw	11	1	7	7	36	46.2%
18	HazMat	EnvSci	10	3	7	6	35	44.9%
19	EnrgyTc	EnrgyMgt	11	3	5	7	34	43.6%
20	HazMat	SiteAssess	12	3	5	6	31	39.7%
21	HazMat	SiteRemed	14	1	6	5	28	35.9%
22	Gen'lEd	Physics	11	7	5	3	26	33.3%
23	OccSfty	Intern-Safety	14	2	6	4	26	33.3%
24	PortWtr	EquipPW	12	5	6	3	26	33.3%
25	Gen'lEd	Biology	11	7	6	2	25	32.1%
26	WWtrQ	EquipWW	12	6	5	3	25	32.1%
27	EnvTech	AirPollution	13	5	6	2	23	29.5%
28	Gen'lEd	TechAlg	12	7	6	1	22	28.2%
29	HazMat	EnvSample	15	4	3	4	22	28.2%
30	WWtrQ	IntroWWtrQ	15	4	4	3	21	26.9%
31	EnvTech	RCRACmpli	16	4	2	4	20	25.6%
32	HazMat	Intern-HazM	18	2	1	5	19	24.4%
33	EnvTech	EnvAudits	17	3	3	3	18	23.1%
34	PortWtr	IntroPWtrQ	17	3	3	3	18	23.1%
35	PortWtr	DisinfectPW	16	4	4	2	18	23.1%
36	WWtrQ	HydraulWW	18	3	1	4	17	21.8%
37	WWtrQ	DisinfWW	16	5	3	2	17	21.8%
38	EnrgyTc	EnrgyStore	16	6	2	2	16	20.5%
39	WWtrQ	AnalWW	16	6	2	2	16	20.5%
40	WWtrQ	Lab/CalWW	18	3	3	2	15	19.2%
41	WWtrQ	InternWW	18	4	1	3	15	19.2%
42	EnvTech	Intern-Env	18	3	4	1	14	17.9%
43	PortWtr	Lab/CalcPW	19	2	3	2	14	17.9%
44	PortWtr	HydraulPW	18	4	2	2	14	17.9%
45	PortWtr	Intern-PW	19	3	1	3	14	17.9%
46	PortWtr	AnalPW	20	1	3	2	13	16.7%
47	EnrgyTc	Off-GridProd	18	5	2	1	12	15.4%
48	EnrgyTc	Biomass+	19	4	2	1	11	14.1%
49	EnrgyTc	Intern-Enrgy	21	3	0	2	9	11.5%

*Max points = 78 (i.e., n/a = 0, Low = 1, Med =2, High = 3)

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favor. An interesting note is how Physics, Biology, and Technical Algebra received ranks lower than the generic Physical Science – and lower than even Arts & Humanities.

Occupational Safety: Most of these skills were looked on with much favor, the exception being the Internship in Safety.

Potable Water Quality: These skills were all ranked low with fewer than 30 points.

Waste Water Quality: These skills were all ranked low with fewer than 30 points.

Environmental Tech: These skills were all ranked low with fewer than 30 points.

Hazardous Materials: Four skills accumulated more than 30 points; in order of importance: Environmental Health, Environmental Law, Environmental Science, and Site Assessment.

Energy Related Tech: One skill accumulated more than 30 points: Energy Management.

SUMMARY

The response rate is quite low. So are the rankings in general -- with exception of some General Education skills and most Occupational Safety skills. These results raise several questions for further consideration:

- Validity of the fax methodology.
- Complexity of the question.
- Relevancy of studied skills to community need.

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Fig. 1: General Education Skill Importance

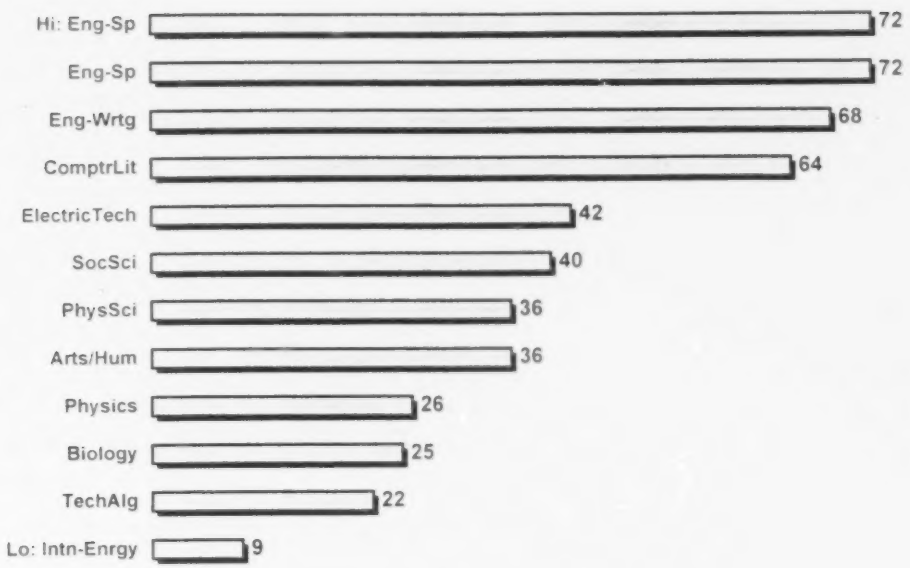

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Fig. 2: Occupational Safety Skill Importance

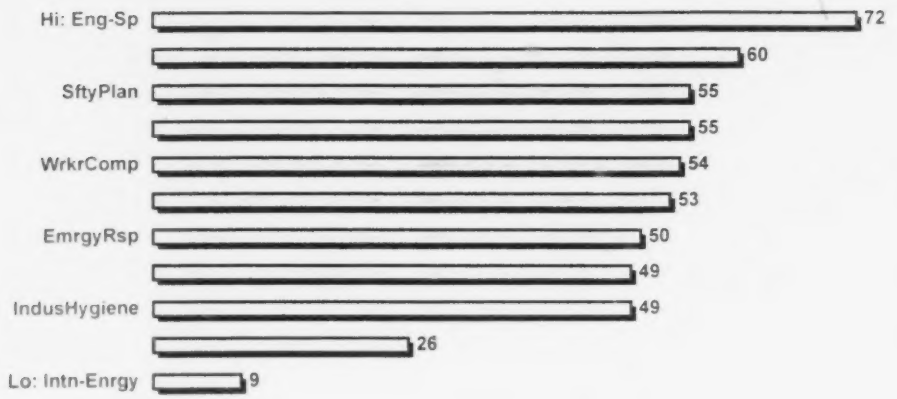


Fig. 3: Portable Water Skill Importance

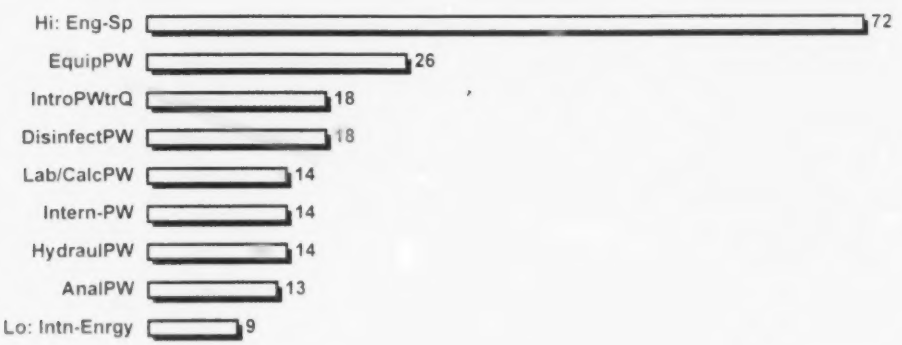


Fig. 4: Waste Water Skill Importance

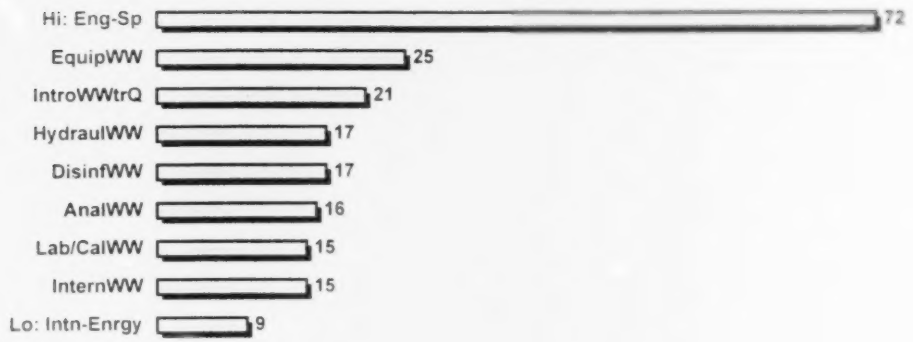


Fig. 5: Environmental Tech Skill Importance

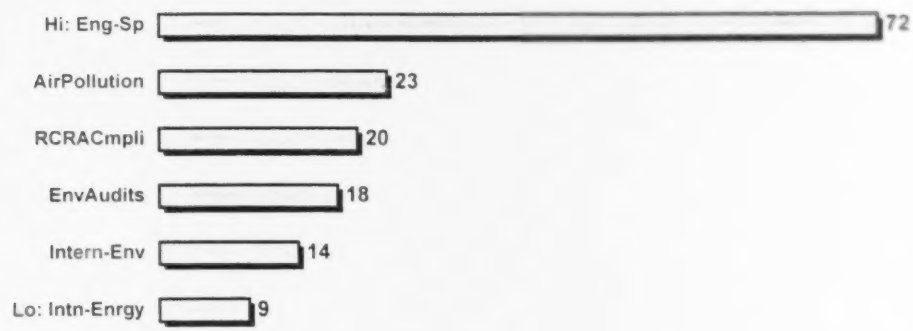


Fig. 6: Hazardous Materials Skill Importance

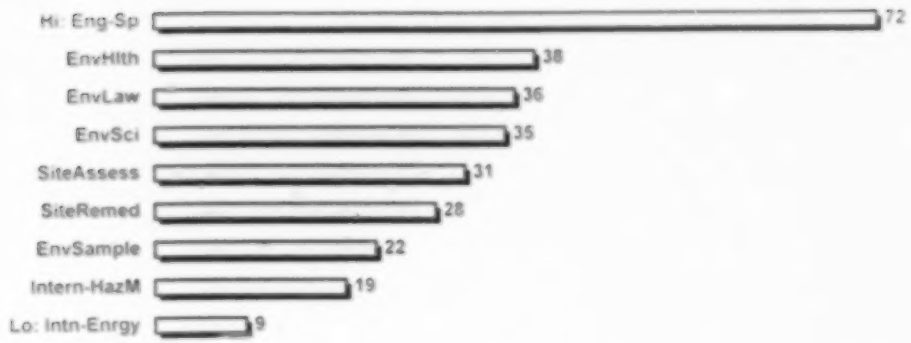
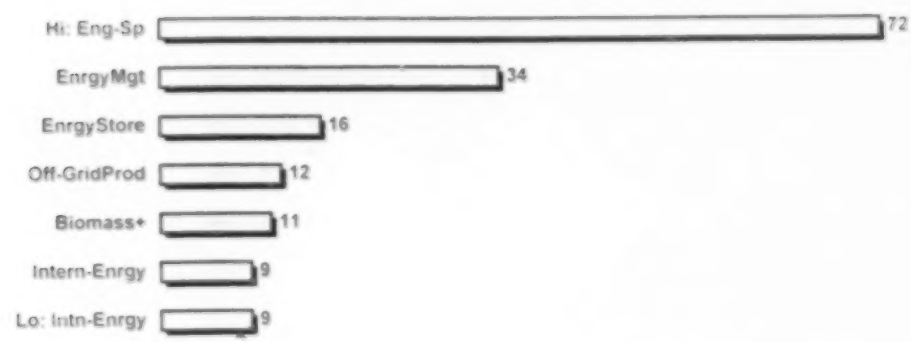


Fig.7: Energy Technology Skill Importance



Sustainable Technology Skill Survey

MCC is in the process of designing an Associate of Science Degree in Sustainable Technology. Your Help is needed to evaluate which skills are most needed for success in related positions at your place of business. Please rate each of the skill areas below as not applicable (N/A), Low, Med or High by circling the appropriate response for each skill item. Your input is an important part of our success in serving the community.

GENERAL EDUCATION				
Technical Algebra	N/A	Low	Mec	High
English (writing skills)	N/A	Low	Mec	High
English (speaking skills)	N/A	Low	Mec	High
Social Science	N/A	Low	Mec	High
Arts/Humanities	N/A	Low	Mec	High
Physical Science	N/A	Low	Mec	High
Computing Literacy	N/A	Low	Mec	High
Physics	N/A	Low	Mec	High
Electrical Technology	N/A	Low	Mec	High
Biology	N/A	Low	Mec	High

OCCUPATIONAL SAFETY				
Emergency Response	N/A	Low	Med	High
Occupational Health	N/A	Low	Med	High
OSHA Industrial Standards	N/A	Low	Med	High
Safety Program Planning	N/A	Low	Med	High
Hazardous Materials	N/A	Low	Med	High
Worker Compensation	N/A	Low	Med	High
Accident Prevention	N/A	Low	Med	High
Industrial Hygiene	N/A	Low	Med	High
Internship	N/A	Low	Med	High

POTABLE WATER QUALITY				
Intro to Water Quality	N/A	Low	Mec	High
Lab Skills & Calculations	N/A	Low	Mec	High
Water Quality Analysis	N/A	Low	Mec	High
Equipment Maintenance	N/A	Low	Mec	High
Hydraulics	N/A	Low	Mec	High
Disinfection Techniques	N/A	Low	Mec	High
Internship	N/A	Low	Mec	High

WASTE WATER QUALITY				
Intro to Water Quality	N/A	Low	Med	High
Lab Skills & Calculations	N/A	Low	Med	High
Water Quality Analysis	N/A	Low	Med	High
Equipment Maintenance	N/A	Low	Med	High
Hydraulics	N/A	Low	Med	High
Disinfection Techniques	N/A	Low	Med	High
Internship	N/A	Low	Med	High

ENVIRONMENTAL TECH				
Air Pollution	N/A	Low	Mec	High
RCRA Compliance	N/A	Low	Mec	High
Environmental Audits	N/A	Low	Mec	High
Internship	N/A	Low	Mec	High

ENERGY RELATED TECH				
Energy Management	N/A	Low	Mec	High
Off-Grid Production	N/A	Low	Mec	High
Energy Storage & Control	N/A	Low	Mec	High
Biomass & Alternative Fuels	N/A	Low	Mec	High
Internship	N/A	Low	Mec	High

HAZARDOUS MATERIALS				
Environmental Science	N/A	Low	Med	High
Environmental Health	N/A	Low	Med	High
Environmental Law	N/A	Low	Med	High
Environmental Sampling	N/A	Low	Med	High
Site Assessment	N/A	Low	Med	High
Site Remediation	N/A	Low	Med	High
Internship	N/A	Low	Med	High

Mahalo for taking the time to complete our survey. If you would like to receive a summary of our survey results, please provide your name and address: _____

Please return the completed survey to: Jean A. Pezzoli, Assistant Dean of Instruction, Maui Community College 310 Kaahumanu Avenue, Kahului, HI 96732, or return by **Fax to 984-3569**

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